Claims

What is claimed is:

1. A pallet for shipping multiple vehicle windshields comprising:

a base structure comprising first second third and fourth upright members, each upright member being positioned at a corner of a substantially rectangular configuration and joined by connecting members to form a substantially rigid substantially rectangular area within said base structure;

a front support bar removably attached between said first and second upright members, said front support bar having a front stop positioned thereon and adapted to support a rear surface of a windshield positioned within said base structure;

a rear support bar removably attached between said third and fourth upright members, said rear support bar having at least one stop that projects into the rectangular space defined by said first, second, third and fourth upright members to support a front surface of a windshield positioned within said base structure;

at least one lower support extending between the connecting member joining said first and second upright members and said connecting member joining said third and fourth upright members, said at least one lower support providing a lower supporting surface for a lower edge of the windshields positioned within said base structure;

Whereby, a plurality of windshields with dunnage placed therebetween can be positioned within said rectangular area of said base with a lower edge of the plurality of windshields supported by said lower support and so that a rear surface of a first windshield is supported by said front stop on said front support bar, and the front surface of last of said plurality of

windshields is supported by said stop mounted on said rear support bar to secure the windshields within the pallet.

2. A pallet as claimed in claim 1 wherein said upright members comprise first, second, third and fourth base stubs to which said connecting members are connected, and first, second, third and fourth post members that are pivotably joined to said stubs.

3. A pallet as claimed in claim 2 wherein said first and third post members are joined by at least one connecting member to form a first rigid side frame, and said second and fourth post members are joined by at least one connecting member to form a second rigid side frame.

4. A pallet as claimed in claim 3 wherein said stubs comprise:

an upper end having a first, second third and fourth side defining a chamber, each of said sides having an upper end, said first side having an upper end lower than the upper end of said second and fourth sides; and

at least one pin extending into said chamber; and wherein said posts comprise;

a lower end sized to fit within one of said chambers; and

a channel proximate to said lower end and extending in a direction away from said lower end, said channel sized to receive one of said pins;

Whereby, said posts are slidably and pivotably connected to said stubs.

5. A pallet as claimed in claim 3 wherein said third and fourth stubs comprise:

a pin extending outward from one of said first, second third or fourth sides; and wherein said third and fourth post members comprise:

a latch for engaging said pin extending outward from one of said first, second third or fourth sides of said third and fourth stubs, respectively,

Whereby when said lower ends of said third and fourth post members are inserted into said chambers of said third and fourth stubs, said latches of said third and fourth post member engage said pin of said third and fourth stub, respectively, and said lower ends of said third and fourth post members are not allowed to be removed from said chambers of said third and fourth stubs, respectively.

6. A pallet as claimed in claim 1 wherein said first, second third and fourth post members comprise:

a plurality of slots located at a plurality of heights on said first, second third and fourth post members; and wherein said front support bar comprises:

a first and a second end;

a first pin located at said first end and sized to be insertable into said plurality of slots on said first post; and

a second pin located at said second end and sized to be insertable into said plurality of slots on said second post; and wherein said rear support bar comprises:

a first and a second end;

a first pin located at said first end and sized to be insertable into said plurality of slots on said third post; and

a second pin located at said second end and sized to be insertable into said plurality of slots on said fourth post.

7. A pallet as claimed in claim 1 wherein said at least one stop on said rear support bar comprises multiple stops rotatably mounted to said rear support bar, each of said multiple stops being dimensioned to project into said rectangular area a different predetermined distance when rotated into said area so to accommodate and support differently shaped windshields.

8. A pallet as claimed in claim 1 wherein;

said first and said third upright members are joined by one of said connecting members; and

said second and said fourth upright members are joined by one of said connecting members, and wherein said at least one lower support comprises:

a first and a second lower support; and wherein said pallet further comprises:

a first transverse member having a first and a second end, said first end attached to said first lower support and said second end attached to said connecting member between said first and said third upright members, said first transverse member comprising a ratchet bar;

a second transverse member having a first and a second end, said first end attached to said second lower support and said second end attached to said connecting member between said second and said fourth upright members, said second transverse member comprising a ratchet bar;

a first side restraint slidably attached to said first transverse member, said first side restraint comprising a side stop bar positioned within the substantially rectangular area within

said base structure and a pawl engageable with said ratchet bar of said first transverse member whereby said first side restraint is allowed to slide from a first position to a second position whether or not said pawl is engaged with said ratchet bar of said first transverse member, the second position located closer to the first transverse member than the first position, and whereby said first side restraint is not allowed to slide from said second position to said first position when said pawl is engaged with said ratchet bar of said first transverse member; and

a second side restraint slidably attached to said second transverse member, said second side restraint comprising a side stop bar positioned within the substantially rectangular area within said base structure and a pawl engageable with said ratchet bar of said second transverse member whereby said second side restraint is allowed to slide from a first position to a second position whether or not said pawl is engaged with said ratchet bar of said second transverse member, the second position located closer to the second transverse member than the first position, and whereby said second side restraint is not allowed to slide from said second position to said first position when said pawl is engaged with said ratchet bar of said second transverse member,

Whereby, when a plurality of windshields are positioned within said substantially rectangular area within said base structure, said first and second side restraints can be slid along said first and second transverse member and away from said first and second lower supports, respectively, until the ear of at least one windshield is contacted by said side stop bars, at which point the pawls of said first and second side restraints engage the ratchet bars of said first and second transverse members, respectively, and said first and second side restraints cannot be slid along said first and second transverse member in a direction away from said first and second lower supports, respectively.

9. A pallet as claimed in claim 1 wherein said upright members comprise:

first, second, third and fourth base stubs to which said connecting members are connected, each stub having a lower end with a post and extension receiving chamber therein; and

first, second, third and fourth post members having an upper end and a lower end, the lower end joined to said stubs, the pallet further comprising:

first, second, third and fourth extensions having an upper and lower end, the upper end sized to be insertable into said chamber of said lower end of said first, second, third or fourth base stub, said lower end of said extensions sized to receive the upper end of said first, second, third or fourth post members.

10. A pallet as claimed in claim 1 wherein said at least one lower support comprises at least one lower stop that projects into the rectangular space defined by said first, second, third and fourth upright members to support a front surface of a windshield positioned within said base structure.

11. A pallet as claimed in claim 10 wherein said at least one lower stop comprises multiple stops rotatably positioned within said rear support bar, each of said multiple stops being dimensioned to project into said rectangular area to a different predetermined distance from said connecting member joining said third and fourth upright members when rotated into said area so to accommodate and support differently shaped windshields.

12. A pallet as claimed in claim 1 further comprising:

a telescoping member with an upper end, said telescoping member attached to said rear support bar, said upper end being adjustable to a plurality of heights above the height of said rear support bar, said upper end defining a channel; and

a strap connected to said base structure and sized to be engageable with said channel.

13. A pallet for shipping vehicle windshields comprising:

a base having four bars arranged to form the sides of a substantially rectangular configuration having a first, a second, a third and a fourth corner; and

a first, a second, a third and a fourth rigid member joined to and extending upwardly from the first, second, third and fourth corners, respectively, each rigid member comprising an upper end, such that the upper ends of the first, second, third and fourth rigid members and the first, second, third and fourth corner define a first area of a protective envelope; and

a means for adapting the pallet to secure a variety of differently sized windshields within the protective envelope based upon the size and/or number of windshields to be shipped.

14. The pallet of claim 13, wherein the means for adapting the pallet to secure a variety of windshields comprises:

a first, a second, a third and a fourth extension engageable with the first, second, third and fourth rigid member, respectively, each having an upper end and each having a lower end formed to cooperatively engage the upper end of the first, second, third and fourth rigid member respectively, such that when the first, second, third and fourth extension are engaged with the first, second, third and fourth rigid member, respectively, the upper end of the first, second, third

and fourth extension and the first, second, third and fourth corner define a second area of the protective envelope.

15. The shipping pallet of claim 14, wherein the base is in a substantially horizontal plane, and wherein the first, second, third and fourth rigid members are at least partially foldable toward the plane of the base.

16. The shipping pallet of claim 15, wherein the first, second, third and fourth rigid members further comprise,

a lower section, and

an upper section joined in movable relationship to the lower section, and

wherein the first rigid member further comprises,

a means for maintaining the lower section of the first rigid member in fixed relationship with respect to the upper section of the first rigid member.

17. The shipping pallet of claim 16, wherein the second rigid member comprises,

a means for maintaining the lower section of the second rigid member in fixed relationship with the upper section of the second rigid member.

18. The pallet of claim 17, wherein the means for maintaining the lower section of the first rigid member in fixed relationship with the upper section of the first rigid member comprises a first latch and pin assembly and the means for maintaining the lower section of the

second rigid member in fixed relationship with the upper section of the second rigid member comprises a second latch and pin assembly.

19. The pallet of claim 18 wherein,

the pin of the first latch and pin assembly is attached to the upper section of the first rigid member,

the latch of the first latch and pin assembly is rotatably attached to the lower section of the first rigid member,

the pin of the second latch and pin assembly is attached to the upper section of the second rigid member, and

the latch of the second latch and pin assembly is rotatably attached to the lower section of the second rigid member.

20. The pallet of claim 13, wherein the base is in a substantially horizontal plane and the means for adapting the pallet to secure a variety of windshields comprises,

a telescoping member, having an upper section, extending in a plane perpendicular to the plane of the base and adjustable to maintain the upper section of the telescoping member at any of a plurality of heights above the base, and

a strap engageable with the upper section of the telescoping member.

21. The pallet of claim 13, wherein the means for adapting the pallet to secure a variety of windshields comprises:

a cross bar, connectable to the third and fourth rigid members; and

a plurality of stops pivotably attached to the cross bar and having a pivot axis, each of the plurality of stops having an effective radius, each effective radius different from the effective radius of another of the plurality of stops.

22. The pallet of claim 21, wherein each of the plurality of stops are attached at a common pivot axis.

23. The pallet of claim 13, wherein the means for adapting the pallet to secure a variety of windshields comprises:

a first and a second lower resilient stop, each of the first and second lower resilient stops comprises,

a first end,

an outer surface, and

a plurality of protuberances, each of the plurality of protuberances having a side rising out of the outer surface at a distance from the first end different from the distance at which the other of the plurality of protuberances rise.

24. The pallet of claim 23, wherein each of the plurality of protuberances rises out of the outer surface at a point axially offset from the point at which each of the other of the plurality of protuberances rises out of the outer surface.

25. The pallet of claim 24, wherein the base comprises,

a front and a back, and

a first longitudinal member, the longitudinal member extending between the front and the back of the base and having a channel therein, the channel sized to receive at least one of the plurality of protuberances, and wherein

the first lower resilient stop is positioned on the first longitudinal member such that at least one of the plurality of protuberances is positioned within the channel.

26. The pallet of claim 13, wherein the base comprises,

a first side and a second side, and wherein the means for adapting the pallet to secure a variety of windshields comprises,

a transverse member, the transverse member extending between the first side and the second side of the base, and

at least one side restraint, the at least one side restraint engageable with the transverse member by a ratchet and pawl.

27. The pallet of claim 26, wherein the ratchet is attached to the transverse member.

28. A shipping pallet for shipping vehicle windshields comprising:

a base having four bars arranged to form a generally rectangular configuration having a first, a second, a third and a fourth corner;

a first, a second, a third and a fourth rigid member joined to and extending upwardly from the first, second, third and fourth corner, respectively, each rigid member comprising an upper end, such that the upper ends of the first, second, third and fourth rigid members and the first, second, third and fourth corner define a protective envelope; and

a first, a second, a third and a fourth extension engageable with the first, second, third and fourth rigid member, respectively, each having an upper end and each having a lower end formed to cooperatively engage the upper end of the first, second, third and fourth rigid member respectively, such that when the first, second, third and fourth extension are engaged with the first, second, third and fourth rigid member, respectively, the upper end of the first, second, third and fourth extension and the first, second, third and fourth corner define an extended protective envelope.

29. The shipping pallet of claim 28, wherein,

the first, second, third and fourth rigid members further comprise a lower end, and

the upper end of the first, second, third and fourth extension are formed to engage the lower end of the first, second, third and fourth rigid members.

30. The shipping pallet of claim 29, wherein the base is in a substantially horizontal plane, and wherein the first, second, third and fourth rigid members are at least partially collapsible toward the plane of the base.

31. The shipping pallet of claim 30, wherein the first, second, third and fourth rigid members further comprise,

a lower section, and

an upper section in movable relationship to the lower section, and wherein the first rigid member further comprises,

a means for maintaining the lower section of the first rigid member in fixed relationship with the upper section of the first rigid member.

32. The shipping pallet of claim 31, wherein the second rigid member comprises,

a means for maintaining the lower section of the second rigid member in fixed relationship with the upper section of the second rigid member.

33. The pallet of claim 32, wherein the means for maintaining the lower section of the first rigid member in fixed relationship with the upper section of the first rigid member comprises a first latch and pin assembly and the means for maintaining the lower section of the second rigid member in fixed relationship with the upper section of the second rigid member comprises a second latch and pin assembly.

34. The pallet of claim 33 wherein,

the pin of the first latch and pin assembly is attached to the upper section of the first rigid member,

the latch of the first latch and pin assembly is rotatably attached to the lower section of the first rigid member,

the pin of the second latch and pin assembly is attached to the upper section of the second rigid member, and

the latch of the second latch and pin assembly is rotatably attached to the lower section of the second rigid member.

35. The pallet of claim 28, wherein the base is in a substantially horizontal plane, the pallet further comprising,

a telescoping member, having an upper section, extending in a plane perpendicular to the plane of the base and adjustable to maintain the upper section of the telescoping member at any of a plurality of heights above the base, and

a strap engageable with the upper section of the telescoping member.

36. The pallet of claim 28, further comprising,

a cross bar, connectable to the third and fourth rigid members at a plurality of locations, and

a plurality of stops pivotably attached to the cross bar and having a pivot axis, each of the plurality of stops having an effective radius, each effective radius different from the effective radius of another of the plurality of stops.

37. The pallet of claim 36, wherein each of the plurality of stops are pivotably attached at a common pivot axis.

38. The pallet of claim 28 further comprising;

a first lower resilient stop.

39. The pallet of claim 28, wherein the first lower resilient stop comprises,

a first end,

an outer surface,

a plurality of protuberances, each of the plurality of protuberances having a side rising out of the outer surface at a distance from the first end different from the distance at which the other of the plurality of protuberances rise.

40. The pallet of claim 39, wherein each of the plurality of protuberances rises out of the outer surface at a point axially offset from the point at which each of the other of the plurality of protuberances rises out of the outer surface.

41. The pallet of claim 40, wherein the base comprises,

a front and a back, and

a first longitudinal member, the longitudinal member extending between the front and the back of the base and having a channel therein, the channel sized to receive at least one of the plurality of protuberances, and wherein

the first lower resilient stop is positioned on the first longitudinal member such that at least one of the plurality of protuberances is positioned within the channel.

42. The pallet of claim 28, wherein the base comprises,

a first side and a second side, and

a transverse member, the transverse member extending between the first side and the second side of the base, and

at least one side restraint, the at least one side restraint engageable with the transverse member by a ratchet and pawl.

43. The pallet of claim 42, wherein the ratchet is attached to the transverse member.

44. A re-useable shipping pallet comprising:

a base;

a first, a second, a third and a fourth post extending from the base and foldable toward the base, each post comprising, an upper section and a lower section, and wherein the first and second post comprise,

a latch and pin mechanism for maintaining the upper sections of the first and second post in fixed relationship with the lower sections of the first and second post, respectively.

45. The pallet of claim 44, wherein the latch and pin mechanism of the first and second lower sections comprise,

a pin rigidly protruding from the lower section of the first post and the second post, and

a latch rotatably attached to the upper section of the first post and the second post.

46. A re-useable shipping pallet for shipping windshields comprising,

a base in a substantially horizontal plane configured to support one or more windshields of varying sizes,

a telescoping member, having an upper section, extending in a plane perpendicular to the plane of the base and adjustable to maintain the upper section at any of a plurality of heights above the base depending on the size of the windshield, and

a strap engageable with the the pallet for retaining the windshields on the pallet.

47. A re-useable shipping pallet for shipping windshields comprising,

a base configured to support one or more windshields of varying curvature,

means for mounting a plurality of stops to the base, and

a plurality of stops pivotably mounted above the base and having a pivot axis, each of the plurality of stops having an effective radius, each effective radius different from the effective radius of another of the plurality of stops, the effective radius being selectable depending on the curvature of the windshield.

48. The pallet of claim 47, wherein each of the plurality of stops is mounted at a common pivot axis.

49. The pallet of claim 48, wherein the means for mounting comprises,

a first and a second post extending from the base, and

a cross bar, connectable to the first and second post at a plurality of locations, wherein the plurality of stops are pivotably mounted to the cross bar.

50. A re-useable shipping pallet for shipping windshields comprising,

a first lower resilient stop having a first end, an outer surface, and a plurality of protuberances, each of the plurality of protuberances having a side rising out of the outer surface at a distance from the first end different from the distance at which the other of the plurality of protuberances rise.

51. The pallet of claim 50, wherein each of the plurality of protuberances rises out of the outer surface at a point axially offset from the point at which each of the other of the plurality of protuberances rises out of the outer surface.

52. The pallet of claim 51, wherein the pallet comprises,

a base having a front and a back, and

a first longitudinal member, the longitudinal member extending between the front and the back of the base and having a channel therein, the channel sized to receive at least one of the plurality of protuberances.

53. A re-useable shipping pallet for shipping one or more windshields comprising,

a base having a first side and a second side,

a transverse member, the transverse member extending between the first side and the second side of the base, and

at least one side restraint for engaging at least one windshield, the at least one side restraint engageable with the transverse member by a ratchet and pawl.

54. The pallet of claim 53, wherein the ratchet is attached to the transverse member.